

REMARKS

Claims 2-15, 17-18, 20-32, 34-46, 48-51, and 53 have been amended. Claim 19 has been cancelled. No new claims have been added. Thus, claims 1-18 and 20-53 are pending.

Claims 2-15, 7-32, 34-46, 48-51, and 53 stand objected to because of certain informalities. Claim 19 has been cancelled and the remaining claims have been amended as suggested by the Examiner. Accordingly, the objection to claims 2-5, 7-32, 34-46, 48-51, and 53 should be withdrawn.

Claims 1-53 stand rejected as being anticipated by Krymski (U.S. Patent No. 6,476,751). This rejection is respectfully traversed.

In many analog-to-digital (A/D) converters, comparators are used to compare an input signal with a reference signal as part of the conversion process. Because comparators can somewhat differ in operation due to process variations, different A/D converters may convert the same input signal as different digital values. That is, each A/D converter may have its own offset from the correct value. To address this issue, A/D converters include calibration circuitry. In conventional A/D converters, the calibration circuitry typically comprises a number of additional capacitors (i.e., capacitors which do not directly participate in the conversion process) and associated control circuitry for controllably coupling the capacitors to the input signal line. In the present invention, the A/D converter is calibrated using a control circuit which is coupled to the same capacitors as those normally used in the conversion (Figs. 1A-1B, capacitors C93, C85, C72, C74, C75, C76, C77, C78).

Accordingly, claim 1 recites: "a control circuit, controlling said capacitors to be used for both analog to digital conversion and for calibration." Claim 16 recites: "... plurality of capacitors, ... wherein the same said capacitors are used both for calibration and for A/D conversion." Claim 33 recites: "calibrating an A/D converter using first

capacitors ... and converting said signal to digital using at least a plurality of said first capacitors for said converting.” Claim 47 recites: “obtaining a value indicative of calibration of an A/D converter using a plurality of capacitors to obtain said value ... and converting an input value using said plurality of capacitors.” Claim 52 recites: “an A/D converter element, ... including a plurality of capacitors and a comparator, ... the same capacitors being used both for said calibrate and for said convert.”

Krymski discloses a low voltage A/D converter. The Office Action alleges that Krymski discloses an A/D converter which utilizes a controller to control the same capacitors for performing analog-to-digital conversion as well as calibration at page 2 (with respect to claim 1) and page 7 (with respect to claims 33, 47 and 52). More specifically the Office Action cites to Fig. 7 for the teaching of the A/D converter and Fig. 4 for the teaching of the control circuit. However, Fig. 4 does not disclose any controller. Fig. 4 is a flow chat illustrating the calibration (step 400) and conversion (steps 402, 404, 406, 408) process. Column 3, lines 46-55. In the calibration process (step 400), only the reference capacitor is adjusted. In the conversion process, only the conversion capacitors are used. Fig. 7, while directed to a different embodiment than that of Fig. 4 (compare, column 2, lines 31-32 with column 2, lines 38-40) is consistent with the embodiment of Fig. 4 insofar as its use of two separate sets of capacitors by showing an offset adjustment circuit 702 comprised of two capacitors which are independent from the conversion capacitors ($2^{n-1}C$, $2^{n-2}C$, ..., C). See column 4, lines 30-53.

Krymski therefore fails to disclose or suggest the above quoted limitations of independent claims 1, 16, 33, 47, and 52. Accordingly, claims 1, 16, 33, 47, and 52 are believed to be allowable over the prior art of record. Depending claims 2-15, 17-18, 20-32, 34-46, 48-51, and 53 are also believed to be allowable over the prior art of record for these reasons and because the combinations defined in the claims are not shown or suggested by the cited references.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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